

REMARKS

The Office Action mailed on August 2, 2004 has been carefully considered and the Examiner's remarks are appreciated. Claims 1-13 were originally presented. Claim 13 has been canceled, and claims 2, 6, and 10 have been amended. Therefore claims 1-12 are presented for examination, with support for the amendments found in the Specification, Claims, and Drawings. In response to the Office Action, Applicants respectfully request reconsideration of the rejected claims in view of the above amendments and the following remarks.

Discussion of Objections to the Specification

The spelling errors on page 7, line 2, and page 9, line 12 objected to by the Examiner have been corrected.

The Examiner also objected to the Specification for failing to provide proper antecedent basis for the claimed subject matter of Claim 13, describing the confluence together downstream. Claim 13 has been canceled.

Discussion of Rejections under 35 USC §102(b)

In the Office Action, the Examiner rejected claims 1-3, 5-7, 9-10, and 13 under 35 U.S.C. §102(b) as being anticipated by U.S. Pat. No. 4,682,808 to Bilanin. Applicants respectfully submit, however, that the 102 based rejections are inappropriate in view of MPEP §2131 as follows in part:

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference"

Each of the independent claims 1, 5, and 9 include the limitation:

"said left and right vertical boattail plates each having a plate width defined by a rear edge spaced from the base surface, and a peak plate width at a location between top and bottom ends thereof, corresponding to a peak vortex of the respective vertically-aligned vortical structures" (emphasis added).

The plain meaning of the underlined clause requires that the peak plate width be found somewhere between, and not including, the top end and bottom end of each of the vertical plates. In other words, and since the adjective "peak" is understood to mean the maximum of something, both the top end and the bottom end must have a plate width which is less than the peak plate width. The analogous mathematical expression would be $x < y < z$, and not $x \leq y \leq z$. Bilanin, however, clearly shows only the top end of the vertical plates having a lesser plate width than the rest of the plate edge which is straight and of uniform width. Thus, while the Examiner concludes that the peak width is along this straight edge, this clearly cannot be the case. And since each and every element is not either expressly or inherently described in Bilanin, or any other single one of the prior art references, it cannot be anticipated by any of them.

Claim Amendments to Further Clarify Distinctions

Notwithstanding the above arguments, Applicants have amended claims 2, 6, and 9 to clarify the distinctions from the prior art. For example, claim 2 now includes the following additional limitation:

"...with the left end of the horizontal boattail plate adjacent the top end of the left vertical boattail plate without extending beyond each other, and the right end of the horizontal boattail plate adjacent the top end of the right vertical boattail plate without extending beyond each other." (emphasis added).

As shown in the figures of the present invention, the upper horizontal boattail plate is arranged between the left and right vertical boattail plates, but the left and right ends do not extend past either. Similarly, each of the left and right vertical boattail plates are arranged below the upper horizontal boattail plate, but does not continue past it. This arrangement produces a configuration with reduced or "chopped off" corners, which allows airflow to turn more quickly at the corners as described in the Specification. In contrast, however, the arrangement shown in Bilanin has the vertical plates extending past the upper horizontal plate, such that the formation of reduced or "chopped off" corners is precluded.

Thus, it is respectfully submitted that all the elements of claims 1-3, 5-7, and 9-10, as originally submitted or as amended, are not set forth in Bilanin, and the 102 based rejections thereof are therefore inappropriate and should be withdrawn in view of MPEP §2131.

Discussion of Rejections under 35 USC §103(a)

The Examiner also rejected claims 4, 8, 11, and 12 under 35 U.S.C. §103(a). In particular, claims 4, 8, and 12 were rejected over Bilanin in view of Denmark Pat. No. 64274 to Rinthoffer; and claim 11 was rejected over Bilanin in view of U.S. Pat. No. 2,665,137 to Kamm. Applicants respectfully submit that the 103-based rejections are inappropriate since the cited references do not teach or suggest all claim limitations as originally submitted or as amended as per discussion above, as required by MPEP §2143.03 as follows in part:

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art"

Furthermore, Applicants respectfully submit that the alleged wedge or triangular shaped boattail plate of Ringhoffer may in fact not be a boattail plate as suggested by the Examiner, as it is not clear from the figure what the three-dimensional construction of the triangular piece might be. In particular, it is not apparent or clear whether the triangular shape at the rear of the schematic automobile is a fin or an outline of the body of the car, i.e. the trunk. Assuming arguendo that the triangular shaped is in fact fin, Applicants respectfully submit that the fin as shown is not a "boattail plate" as used herein and in the application for "bluff body" applications. The figure shown in Ringhoffer is of a "streamlined body" (see page 6, paragraph 19 discussing the distinction) and not a bluff body, and therefore does not inherently involve a sizeable "recirculation zone" as does the present invention. It is thus submitted that such a "fin" would not produce the same or similar vortical structures in a manner described for the present invention. And there is therefore, no teaching or suggestion to provide wedge shaped boattail plates for the purpose of improving the aerodynamic drag experienced by bluff bodies.

With respect to the Kamm reference, a streamlined body is also shown, but with fins having curvilinear edges. The fins, however, are located above the vehicle, and not to the rear of a base surface as required for the present invention. Thus, these fins arguably would not have any meaningful effect in controlling the effect of the sizeable recirculation zone created adjacent a base surface of a bluff body in a flowstream. In support of his rejections, the Examiner stated that it would have been obvious to one of ordinary skill in the art to,

“round the edges of the plates to produce convexly curved plate edges as taught by Kamm in order to reduce weight of the plates as well as reduce accidental impact damage at the corners.” While a rounding of the edges of the plates would certainly reduce the weight of the plates and possibly reduce accidental impact damage at the corners, this line of reasoning however provides no teaching or suggestion to combine such curvilinear feature to the boattail plates of the present invention in order to improve the aerodynamic drag experienced by bluff bodies.

Therefore, Applicants respectfully submit that claims 4, 8, and 12 are not obvious over the cited references, and the 103-based rejections thereof are therefore inappropriate and should be withdrawn.

Summary

Having amended the claims and/or overcome Examiner's rejections as discussed above, Applicant respectfully submits that claims 1-12 are in condition for allowance. Applicants respectfully request allowance of claims 1-12.

In the event that the Examiner finds any remaining impediment to the prompt allowance of these claims that could be clarified with a telephone conference, he is respectfully requested to initiate the same with the undersigned at (925) 422-7274.

Respectfully submitted,

Dated: February 2, 2004

By: 

James S. Tak
Attorney for Applicant
Registration No. 46,367

Lawrence Livermore National Lab
7000 East Avenue, L-703
Livermore, CA 94550
TEL: (925) 422-7274
FAX: (925) 423-2231